Full Scale Scanner

OPERATOR'S GUIDE

ScanPlus III

"Note" In this manual, scanners are called out as "CONTEX". The ScanPlus III and the Contex FSSx200 series are the same.

Cross Reference: ScanPlus III 300 = Contex FSS3200
ScanPlus III 500 = Contex FSS5200
ScanPlus III 800 = Contex FSS8200
ScanPlus III 1000 = Contex FSS10200

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PREFACE

The Contex Full Scale Scanners provides a complete solution for scanning drawings and pictures for use with CAD, DTP, FAX, and Drawing Archival programs.

The built-in dedicated high-speed Digital Signal Processor (DSP) do image processing and enhancement in real time.

The Full Scale Scanners fast industry standard SCSI I/F makes it truly multi-platform. Allowing you to use the scanner with many different computers and workstations.

The CADImage/SCAN scanning software is available in DOS, WINDOWS, and WINDOWS-NT editions for the PC or PS/2 computers, MAC edition for the Macintosh, UNIX editions for the SUN, HP, IBM RISC, SILICON GRAPHICS and DEC workstations, with support of yet more to come.

This guide explains how to operate and maintain the Full Scale Scanner. It assumes a basic knowledge of your computer and operating system, it does not repeat material from this documentation.

SYSTEM REQUIREMENTS

- IBM PC or PS/2 compatible(386 or later processor), Apple Macintosh, or one of the supported UNIX workstations.
- CADImage/SCAN scanning software edition and SCSI interface kit matching your workstation.

RELATED PUBLICATIONS

The "OPERATIONS GUIDE" which came with your computer.

The "OPERATING SYSTEM USER MANUAL" for your workstation.

The "CADImage/SCAN USER's GUIDE".

The "READ.ME" file on the distribution diskettes. Use your text editor or list command to look for latest news and updates.

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HOW TO USE THIS GUIDE

This guide contains six chapters, and four appendices. Make sure you read Chapter on: "Installation" , before attempting to install or use the Full Scale Scanner and software described in this guide.

Chapter 1 is an introduction to the Full Scale Scanner and gives an overview of its use with CAD, Desktop Publishing, FAX and Drawing Archival applications.

Chapter 2 gives an overview of the Full Scale Scanner system and features.

Chapter 3 describes the functions and the use of the Full Scale Scanner operator panel and indicators.

Chapter 4 discusses the operation of the Full Scale Scanner.

Chapter 5 describes the installation of the Full Scale Scanner onto your system.

Chapter 6 describes how to perform user maintenance on the Full Scale Scanner.

Appendix A. contains a glossary.

Appendix B. lists the Full Scale Scanner Specifications.

Appendix C. contains the regulations applicable for the Full Scale Scanner.

Appendix D. Full Scale Scanner License Agreement.

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1. Introduction

CADImage/SCAN is a program designed to interface your Contex Multi-Platform Scanner with a wide range of popular software for CAD, Desk Top Publishing, FAX, and Drawing Archival/Interchange (System configuration shown overleaf).

- Controlling all of the Contex range of Multi-Platform Scanners advanced image enhancement features. With standard graphic user interface for ease of use.

- Point-and-Click in overview of total drawing, for easy on-line setting of threshold, scanwindow and alignment. During scanning it provides for easy verification of quality

- AutoScan, ensures optimal ease and cleanness of scanning. Tiled, Strip or Global auto-thresholding selectable, as well as interactive graphic graytone histogram presentation.

- Supports more than forty important industry standard Image File Formats including PICT, TIFF formats, CALS and ISO-ODA CCITT Group 4 compressed format, Intergraph RLE and CIT, and Image Systems CADOverlay RLC format for AutoCAD.

- Converting between Image File Formats, with easy Point-and-Click set-up of horizontal alignment and convert-window for converting part of a drawing .

- Alignment, perfect electronic horizontal deskewing of drawings, permits to correct skew when scanning, with Point-and-Click setable alignment points.
  Rotation of drawings, between 0 and 360 degrees.
  Electronic despeckling, removes speckles with setable size.
  Reversing and mirroring of drawings.

- Browse, and Zoom to any level, in scanned drawings. Measure angle and distance between any two points.

- Print/Plot to Laserprinters, and industry standard Ink-Jet, Electrostatic and Thermal Plotters, with setable printwindow for printing part of a drawing, and setable scaling or autoscaling.

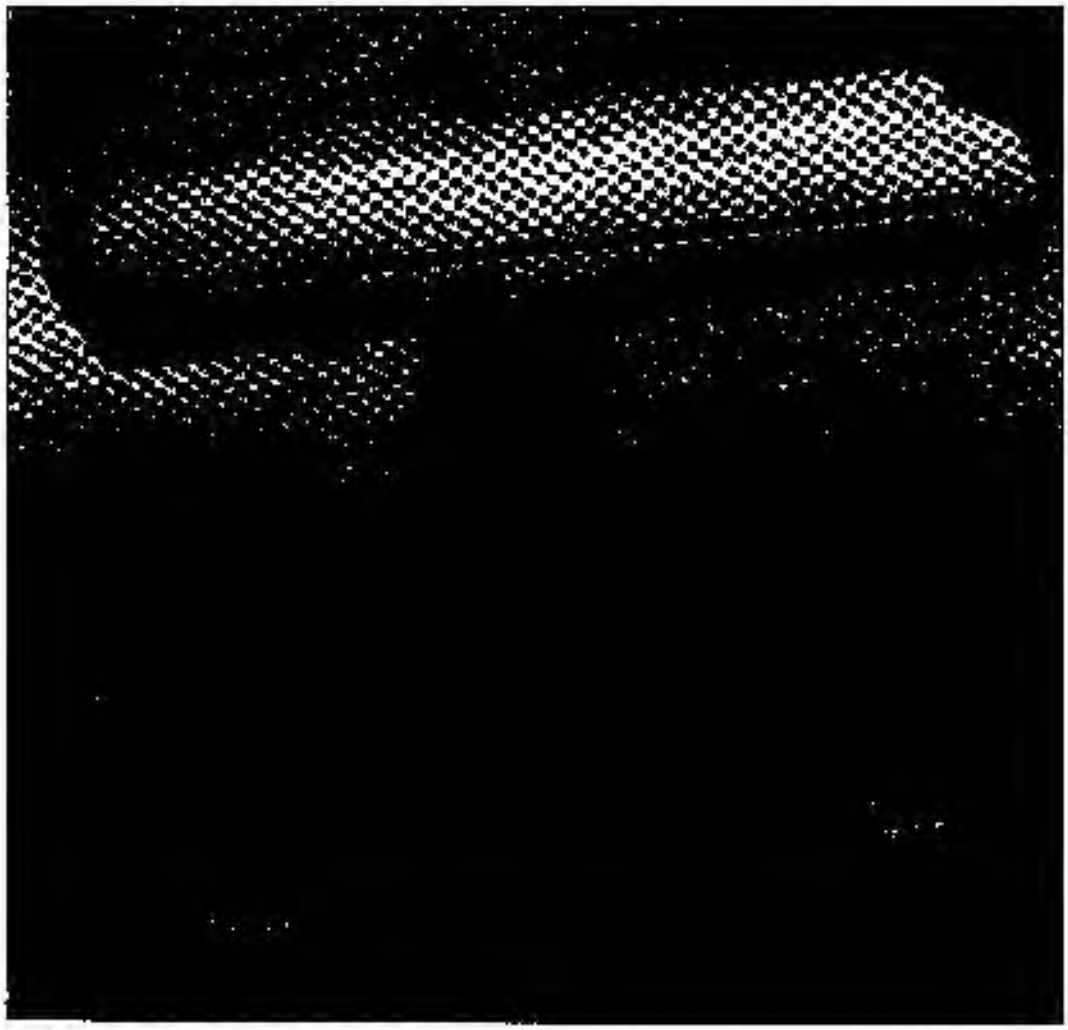

Fig.1.1 Full Scale Scanner

The FSS and the CADImage/SCAN program scan hard-copy originals directly into the workstation. Formats up to E-Size(A0) can be scanned, so you can capture drawings for modification, storage, or transmission, or bring hard-copy on-line.

The FSS scans original line art, maps, blueprints, sepias, vellum and mylar drawings in high resolution. The Full Scale Scanner has a built-in reflecting spring-loaded background pressure platen, to support scanning of transparent originals.

The unique two-dimensional 2D-Adaptive thresholding and built-in high-speed Digital Signal Processor provides clean crisp scans from poor quality drawings on-line without prescan. Automatically adapt-

ing to the drawing, compensating for varying background, faded areas and stains.

CAD-systems such as AutoCAD, VersaCAD etc. can make full use of the Full Scale Scanner, either directly or together with raster-editors, archiving, overlay or raster-to-vector conversion programs. The FSS is a time saving way to capture the machine-drawn or hand-drawn originals to an electronic medium.

Using the FSS and CADImage/SCAN with a laser printer provides an inexpensive and convenient way to transform any large format technical drawing into a handy-sized copy for enclosure in reports or documentation; or you can use them with an electrostatic or thermal plotter for a full size copy.

1.2 Desk Top Publishing Systems

With the FSS you can now scan originals of almost any size into the computer to include them as part of technical documents, user manuals, sales brochures, spare part catalogues, proposals and bids, and so on, using popular desk top publishing applications such as Aldus PageMaker or Ventura Desk Top Publisher.

Through CADImage/SCAN the FSS is compatible with most software, and standard DTP file formats. The FSS Window Scan feature allows you to cut and scissor parts of interest out of larger drawings.
With its ease of use and flexibility of original sizes and file formats, the FSS addresses the scanning needs of the technical publishing office.

1.3 Facsimile

The Full Scale Scanner can either reduce a large format drawing into a single fax page, or split it electronically (PC version only) into multiple unreduced fax pages, suitable for transmission by facsimile or E-mail, using a standard telefax Extension-Card and FAX software.

Splitting up a drawing into multiple FAX pages, allows you to send a large drawing via fax and reassemble it at the receiving end without losing resolution and detail.

1.4 Drawing Archival and Management

An organization's wealth is held in its archives. Electronic Drawing Management Systems allows on-fine access and control of company assets such as scanned mechanical drawings, electrical schematics and facility plans on hard- or optical disks. A single exchangeable 5 1/4 optical disk cartridge can store 800 to 1000 E-Size drawings, so your archives could contain several hundreds of thousands of drawings.
Electronically accessing, viewing, modifying, converting and printing or plotting your drawings will save you time and money.
The FSS supports the Computer Acquisition and Logistics (CALS) and ISO-ODA standard CCITT Group4 (MIL 28002) drawing archival formats.

1.5 Satellite Photo Scanning

Use the Full Scale Scanners graytone scanning capability of 256 levels, together with applications like CADOverlay GS, to directly overlay satellite photos in AutoCAD, with image correction facilities.

2. System Overview

The Full Scale Scanner, shown in the system overview overleaf, uses single, dual, triple, or quadruple 5400 pixel CCD Cameras and individual adaptive light compensation on each pixel. The FSS includes the following features:

- Connection to the computer via standard SCSI Interface
- Scanning area sized from A5 up to A0 and E-Size (from 152mm. up to 914mm. wide). Media size: 152 to 1016 mm.
- **FSS10200^{DSP}**: Up to 1000 dpi scan resolution at all original sizes; 36.000 dots at 1000dpi, scanned at the max. scan width(36" or 914mm.), by graytone interpolation and resampling of the physical 21.600 pixels (four cameras).
- **FSS8200^{DSP}**: Up to 800 dpi scan resolution at all original sizes; 28.800 dots at 800dpi, scanned at the max. scan width(36" or 914mm.), by graytone interpolation and resampling of the physical 16.200 pixels (three cameras).
- **FSS5200^{DSP}**: Up to 500 dpi scan resolution at all original sizes; 18.000 dots at 500dpi, scanned at the max. scan width (36" or 914mm.), by graytone interpolation and resampling of the physical 108000 pixels (two cameras).
- **FSS3200^{DSP}**: Up to 300 dpi scan resolution at all original sizes; 10.800 dots at 300dpi, scanned at the max. scan width (36" or 914mm.), by graytone interpolation and resampling of the physical 5.400 pixels (one camera).
- Image Processing and Enhancement options include: High and low contrast 2D-Adaptive thresholding, dynamic and thin-line pixel enhancement, histogram analysis, and on-line threshold variation.
- On-line deskewing and despeckling, simultaneously with scanning of the drawing it can be perfectly horizontally aligned and the speckles removed.

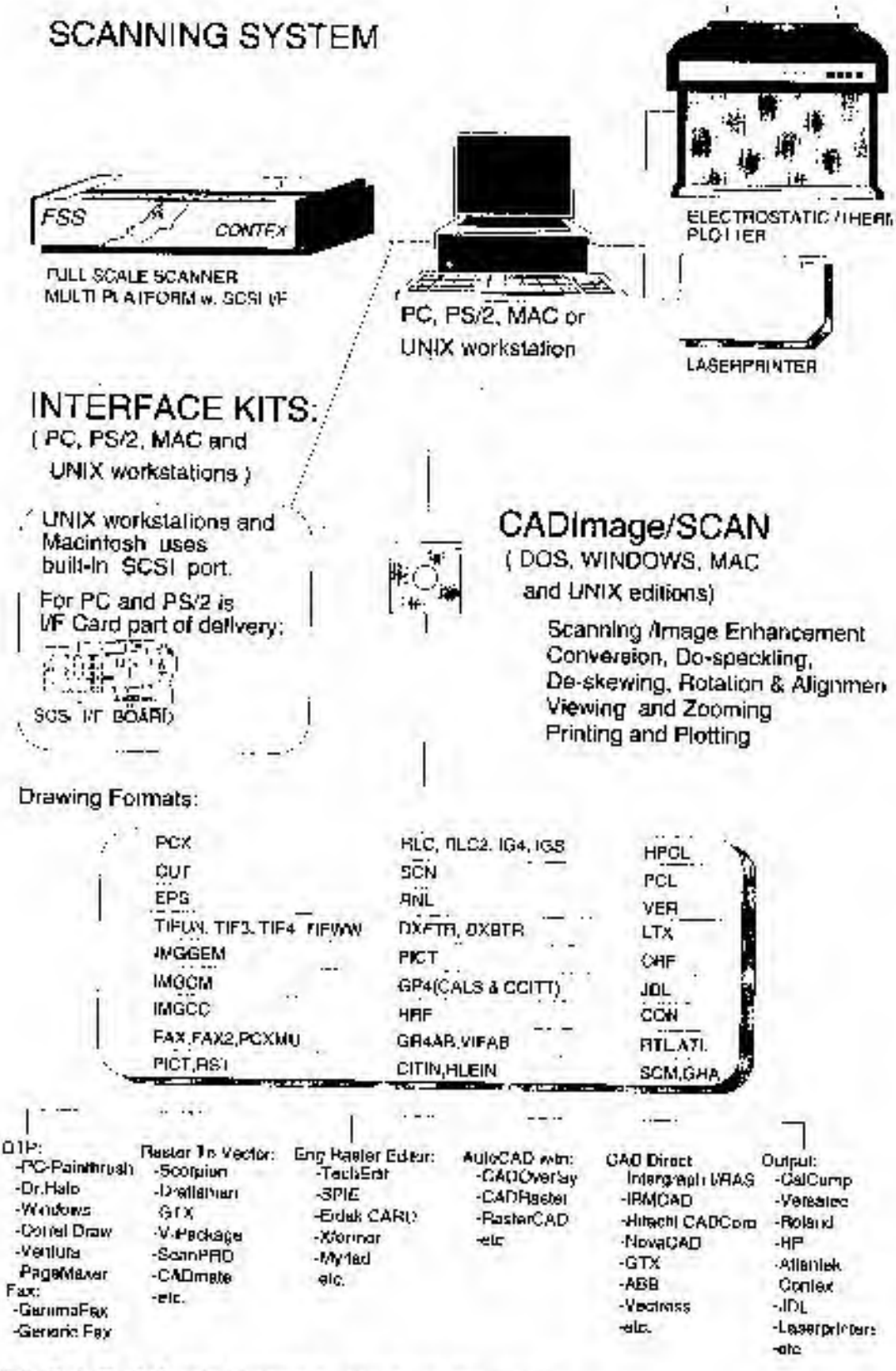

Fig.2.1 Full Scale Scanner System Overview

- 256 graytone levels (1 Byte, 8 Bit per pixel).
- CADImage/SCAN interface software: Scanning, Conversion, Rotation, Cropping, Alignment, View, Zoom and Print/Plot of large format drawings to/between/from multiple industry standard file formats.

SCSI Interface. On UNIX workstations and the Macintosh, the Full Scale Scanner connects directly to the SCSI I/F port on the processor unit using the SCSI cable that comes with the CADImage workstation interface kit.
For the PC the CADImage interface kit contains a SCSI- PC extension board interfacing between the PC bus connector and the Full Scale Scanner. The SCSI interface board is available in two versions, for the PC Bus (ISA), and the PS/2 Micro Channel Adapter (MCA).

CADImage/SCAN. The scanning program enables the user to control all the Full Scale Scanner functions and image processing features.

The program produces a multitude of standard output image file formats compatible with CAD, Raster-Editor, Digitize, Overlay, Archiving and Raster-to-Vector programs for Editing, Storing, Conversion and Print/Plot of scanned drawings, maps etc. to be used with CAD, DTP and FAX systems.

CADImage supports electronic Rotation and Alignment, as well as Converting, Viewing, Zooming and Print/Plot of scanned drawings.

The Full Scale Scanner Operator Panel layout shown overleaf is divided into two keys and four indicators. The two operating keys are positioned at the top: " The Paper Reverse key (C), and the Paper Feed/Forward key (A) with a Ready indicator (B) attached". Three indicators at the bottom: "Power on (D), Warm-Up (E), and Diagnostic (F) indicators". The detailed function of the keys and indicators are:

A, B : Paper Feed/Forward Key and Ready Indicator.

Insert the drawing face down into the scanner original insertion slot, the green "Ready indicator (B)" turns "on" when the drawing is correctly positioned. Now press the "Feed Forward key (A)", and the drawing moves into the start-of-scan position. The "Ready indicator" stays "on", signifying that the scanner is ready for control from the computer.
During scanning the "Ready indicator" is blinking.
At end of scanning the "Ready indicator" is again steady "on" signifying that scanning can be redone from the computer, or finished by the operator pressing the "Paper Feed/Forward key" to eject the drawing from the scanner.
Pressing the "Paper Feed/Forward" key during scanning, stops the scanning and feeds the original as long as the key is pressed.
NOTE : If the drawing is removed from the scanner manually without pressing the "Paper Feed/Forward key" to eject, the "Ready Indicator" will stay on, this condition is reset by pressing the "Paper Feed/Forward key".

C : Paper Reverse Key.

The reverse key stops the scanning and reverses the original while the key is pressed.

D : Power On indicator

Lights when scanner has power on.

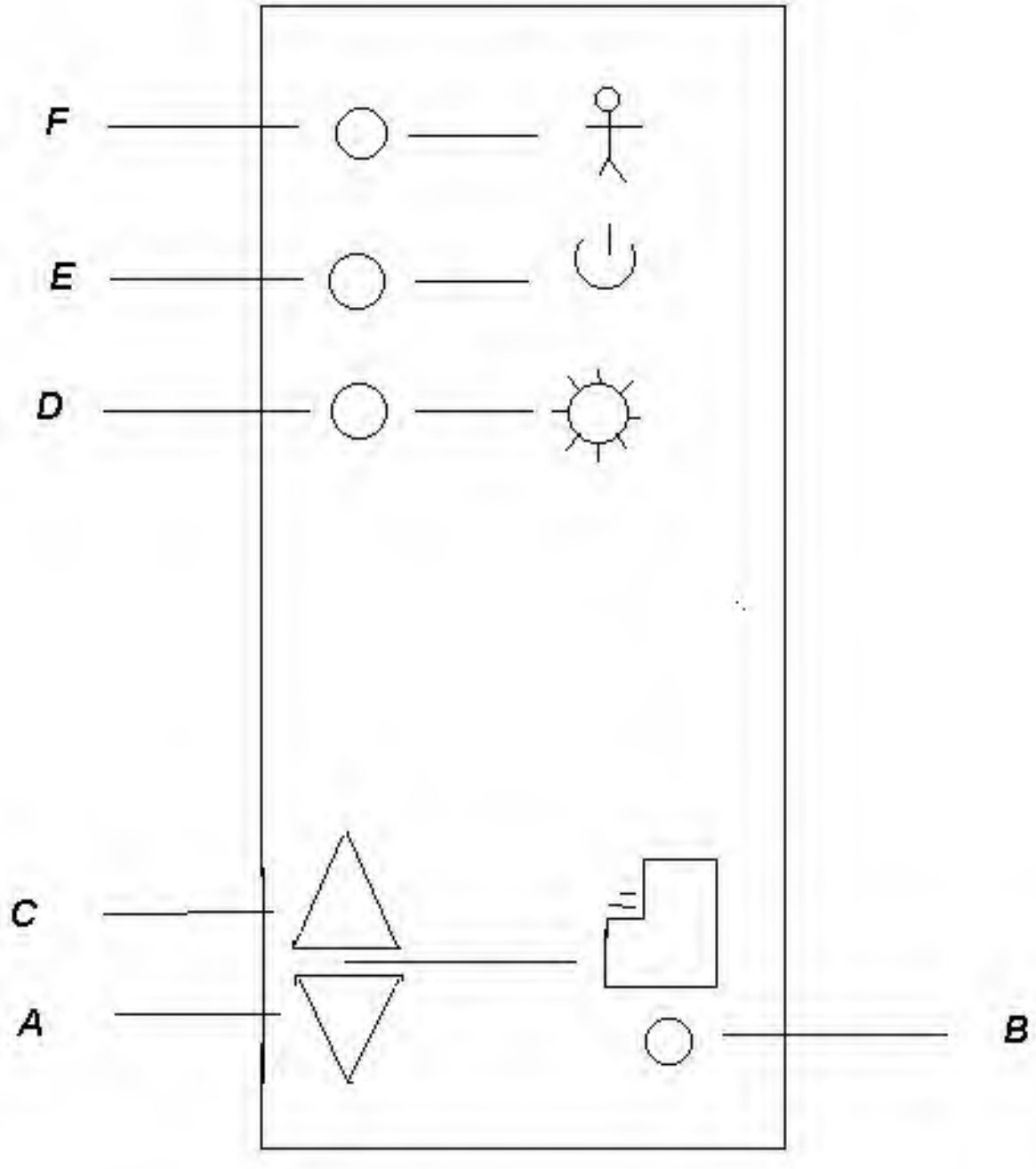

Fig.3.1 FSS Operator Panel

E : Warm Up Indicator (Wait).

Lights when the Full Scale Scanner power is turned on, and stays on during the internal diagnostic and stabilization phase. Keyboard input is prevented during this time.

F : Diagnostic Indicator.

Flashes if an error is detected by the built-in diagnostic.
If both the "Diagnostic" and the "Warm up (Wait)" indicators flashes it signifies that too little light is seen by the cameras, this could stem from the user height adjustment being out of range, see the chapter:"Maintenance" for guidance.

3.1 Original Insertion Slot and Ruler

The original insertion slot shown below is marked with a measurement ruler from 0 to 8.5. The dividings corresponds to the Scan-Width setup in the CADImage scanning software.

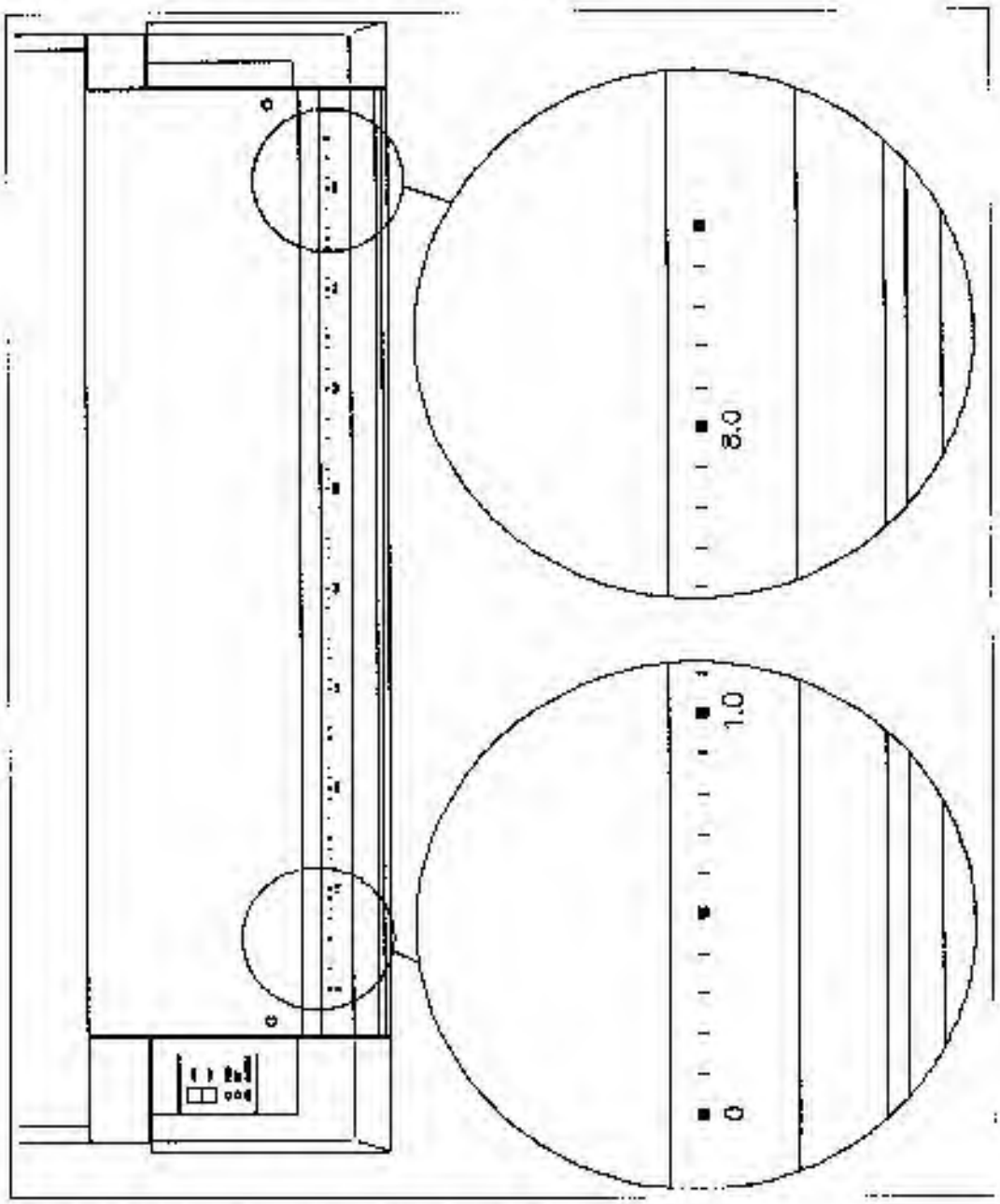

Fig.3.2 Original Insertion Slot and Ruler

4. Operating modes

The Full Scale Scanners work in two operating modes:

- Line mode (bitmapped, 2-level).
- Graytone mode (256 graytones).

4.1 Line mode

In this mode, the Full Scale Scanner will output each scanned pixel as a single bit, either black (1) or white (0) depending on whether or not its greylevel is below or above the threshold level.

The distance (both horizontal and vertical) between each pixel at resolutions representatively* used with CAD is:

200 dpi:	0.1270 mm.
300 dpi:	0.0846 mm.
400 dpi:	0.0635 mm.
600 dpi:	0.0423 mm.

*Lower and higher resolutions are also available.

The resolution in dpi is always set from CADImage.

The Scan-width is likewise set from CADImage, in the units of the ruler printed at the original insertion slot on the Full Scale Scanner, see the Chapter: "Operator Panel and Indicators."

The following table shows the number of pixels per line resulting from various combinations of scan-width and resolution:

Resolution:	**600 dpi**	**400 dpi**	**300 dpi**	**200 dpi**
Scan-width:				
8.5	21,600	14,400	10,800	7,200
8.	20,352	13,568	10,176	6,784
6.	15,240	10,160	7,620	5,088
4.	10,176	6,784	5,088	3,392
3.	7,620	5,080	3,810	2,544
2.	5,088	3,392	2,544	1,696

The following table shows some common drawing widths and their required scan-width settings:

Scan-width:	**Original Drawing Width*:**	
	Minimum media size of FSS	6.0"/152mm.
1.4	Minimum Scan Width (A5)	6.0"/152mm
2.	A-Size (letter) and approx. A4	8.5"/216mm
2.6	B-Size (11")	11.0"/280mm
2.8	A3 (297mm)	11.9"/302mm
3.	Approx. A3 and approx B-Size	12.7"/323mm
3.9	A2 (420mm)	16.5"/420mm
4.	C-Size and approx. A2	17.0"/430mm
5.2	D-Size (22")	22.0"/560mm
5.5	A1 (594mm)	23.3"/592mm
6.	Approx. A1 and approx D-Size	25.4"/646mm
7.8	A0 (841 mm)	33.1"/840mm
8.	E-Size and approx. A0	34.0"/862mm
8.5	Max.ScanWidth of FSS	36.0"/914mm
	Max.Media size of FSS	40.0"/1016mm

*The required setting for an original drawing can be measured on the printed ruler on front of the Full Scale Scanner, when the original is inserted into the FSS.

4.2 Graytone mode

In Graytone mode, the actual graylevel of each pixel is scanned; 256 levels are recognized, corresponding to 1Byte (8 bits) per pixel. This results in graytone files are 8 times larger than uncompressed files scanned in line mode at the same resolution, for example an E-Size drawing scanned in graytone mode at 300 dpi has a file size of 150 MByte, compared with typical 0.4 -1.0 MByte for a compressed file in Line mode).

5. Installation

The Full Scale Scanner should be placed on a table with the front of the machine overhanging the table edge by approximately 1 cm to ensure that the scanned original can hang freely from the original exit slot at the front of the machine. The table should be placed a few centimeters from the wall, to allow large size originals to hang down behind the table. Or you can place the FSS on the optionally available specially designed stand-alone floor stand.

Important: Before connecting the power cord to an electrical outlet, be sure that the voltage selector switch just above the mains inlet is set to the correct voltage.

Make sure that power is turned off, and connect the SCSI cable that came with your interface kit to one of the two SCSI connectors found at the back of the Full Scale scanner. If the scanner is the last device on the SCSI bus insert the SCSI terminator that came in the interface kit in the other SCSI connector

For the PC and PS/2 you must now install the SCSI interface board that is part of your interface kit, as described in the following sections.
For the Macintosh and UNIX workstations with a built-in SCSI interface, simply turn power off and connect the scanner SCSI cable.

You are now ready to install the CADImage/SCAN scanner control software and set up the SCSI address of the scanner, as described later in this chapter and in the CADImage User Manual that came with your interface kit.

5.1 Installation of the ISA-SCSI board in a PC.

The following describes installation in a PC with ISA-Bus (installation in a PS/2 with MCA bus is described in section 7.2)

1. Set the PC-system unit power switch to OFF.

2. Set any external option power switches to OFF (such as printers, displays etc.).

3. Unplug the PC-system unit and all other options from the wall outlet.

4. Position the PC-system unit to allow access to the rear.

5. Use a screwdriver to loosen the PC-system unit cover mounting screws.

6. Carefully slide the PC-system unit cover away from the unit, tilt the cover up, remove it from the base and set it aside.

7. Look at the left rear panel. There are 5, 7 or 8 system expansion slots. The SCSI board may be installed in any of these.

8. Use a screwdriver to loosen the screw that holds the system expansion slot backpanel in place, remove the backpanel.

9. Hold the SCSI board by the top corners and firmly press the board into the expansion slot.

10. Use a screwdriver to lock the screw that holds the SCSI backpanel, and replace the PC-system unit cover by performing above points 6. to 3. in reverse.

11. Connect the SCSI cable from the FSS Scanner to the connector on the SCSI board backpanel.

12. PC SCSI board Switch SW1 Set-up is described overleaf in section:"ISA-SCSI board setup".

ISA-SCSI board Setup:

The table below gives all valid combinations of ISA-SCSI board DIL-Switch SW1 setup.
The jumper fields SR2 and SR3 are factory setup to A:DRQ1 and A:DACK1 and should not be moved, jumper fields SR1 and SR4 have no jumpers.
If a conflict exists between the SCSI board and your PC-Display adapter or other board, you will have to experiment with different settings of SW1 on the SCSI board. The default setting is:

Factory default: SW1: **ON OFF ON ON**

Set-up Table:

		ISA-SCSI board DIL-Switch SW1			
	no.:	**1**	**2**	**3**	**4**
Memory Address:					
	C000:0000-07FF	ON	ON	ON	ON
	C400:0000-07FF	OFF	ON	ON	ON
Default	C800:0000-07FF	ON	OFF	ON	ON
	CC00:0000-07FF	OFF	OFF	ON	ON
	D000:0000-07FF	ON	ON	OFF	ON
	D400:0000-07FF	OFF	ON	OFF	ON
	D800:0000-07FF	ON	OFF	OFF	ON
	DC00:0000-07FF	OFF	OFF	OFF	ON
	E000:0000-07FF	ON	ON	ON	OFF
	E400:0000-07FF	OFF	ON	ON	OFF
	E800:0000-07FF	ON	OFF	ON	OFF
	EC00:0000-07FF	OFF	OFF	ON	OFF
	F000:0000-07FF	ON	ON	OFF	OFF
	F400:0000-07FF	OFF	ON	OFF	OFF
	F800:0000-07FF	ON	OFF	OFF	OFF
	FC00:0000-07FF	OFF	OFF	OFF	OFF

5.2 Installation of the MCA-SCSI board in a PS/2

1. Copy the PS/2 SCSI board (SMIA) configuration file: @6E03.ADF to the PS/2 start diskette.

2. Turn the systems power off and install the PS/2 SCSI board (SMIA) into the PS/2, as described previously for the PC omitting step 12: setting of board switches.

3. Boot the PS/2 using the PS/2 start diskette. When the "165=not ok" error message appears press the F1 key to start program execution.

   1.menu: Do not choose automatic configuration.

   2.menu: Choose "Configuration" (line 3. Manual Configuration).
   3.menu: Choose "Change Configuration"(line 2.)

   4.menu: Press the "Pg Dn" key, to move down to the line containing the SMIA memory base address setting. If the default setting is marked with an asterisk, move forward and backwards by pressing the F6 and F5 keys to find a valid (unmarked) setting.

   5.menu (same as 3.menu):
   Select line 3. (copy configuration), and press ENTER when prompted.

   6.menu (same as 3. and 5.menu):
   Press ESC and press ENTER when prompted.

4. Remove the start diskette and reboot the PS/2 from the hard disk.

5.3 SCSI Address Setup

Turn off power to computer and scanner when setting the SCSI device number, it is only read from the scanner DIL-switch on power up of the scanner.

Set up the SCSI device no. on the DIL-switch found besides the SCSI connectors on the Full Scale Scanner to an unused SCSI device address no. according to the table below:

Switch no.:	1	2	3	4	5	6	7	8
SCSI device no. 0:	ON	ON	ON	X	X	X	X	OFF
SCSI device no. 1:	OFF	ON	ON	X	X	X	X	OFF
*SCSI device no.2:	ON	OFF	ON	X	X	X	X	OFF
SCSI device no. 3:	OFF	OFF	ON	X	X	X	X	OFF
SCSI device no. 4:	ON	ON	OFF	X	X	X	X	OFF
SCSI device no. 5:	OFF	ON	OFF	X	X	X	X	OFF
SCSI device no. 6:	ON	OFF	OFF	X	X	X	X	OFF
SCSI device no. 7:	OFF	OFF	OFF	X	X	X	X	OFF

* Factory Default X: Don't Care

Turn on power to computer and scanner.

NOTE: For PC-ISA installations CADImage automatically search for the memory location of the SCSI I/F board. If unsuccessfull you properly need to resolve conflicts with other I/O boards, please refer to the section:"ISA-SCSI I/F board Set-up" to change the memory address on the board.

5.4 Installation verification

Install the CADImage program as described in the USER GUIDE that came with the program.

Run the Heigth Adjustment of CCD Cameras described in the Chapter: "Maintenance" to verify above installation.

6. Maintenance

Clean the original scanning area, and adjust the height of the CCD-Cameras at regular intervals.

6.1 Cleaning of Original Scanning Area:

When cleaning the original scanning area, turn the power switch OFF and disconnect the Power plug.

1. Open the FSS front cover by gently pulling at the top of the cover.

2. Remove the original guide plate and gently wipe clean the glass plate and the white area on the Original Guide Plate.

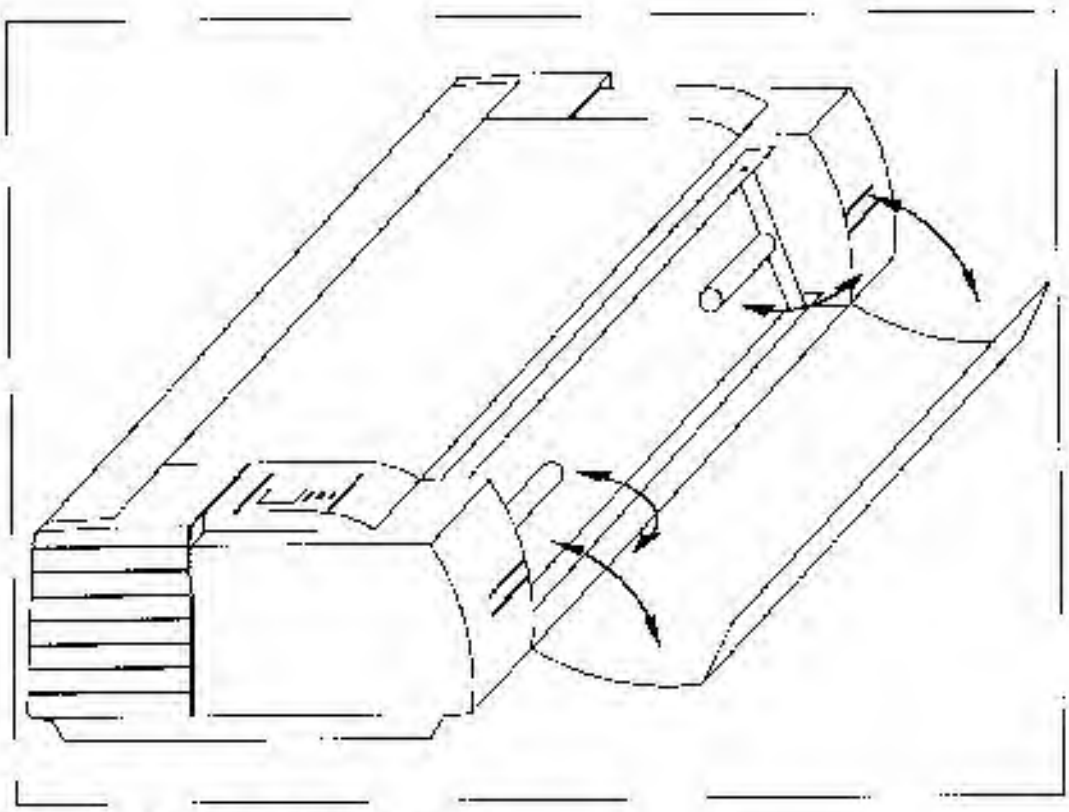

Fig.6.1 Removal of front cover

6.2 Heigth adjustment of the CCD Cameras

The following adjustment applies to the different models:

FSS5200^{DSP}:

1. Insert the Height Alignment Chart delivered with the FSS into scanner and press the "Paper Feed/Forward key". In CADImage select Scan-Width size of 8.5, and start prescan with "Forward". Press "Halt" to stop the prescan over the horizontal lines in the chart, and horizontally set the "detail window" so as to be in the middle of the "overview window" The "detail window" should show a picture similar to one of the three below.
2. Use a slim screw-driver to turn the heigth adjustment screw through the hole (1) at the top of the FSS (see figure overleaf) clockwise or counter-clockwise so that the lines from the left and right CCD-Cameras make a continuous line on the down-scans on the screen:
   Clockwise: Line at right side of screen moves down.
   CounterClockwise:Line at right side of screen moves up.

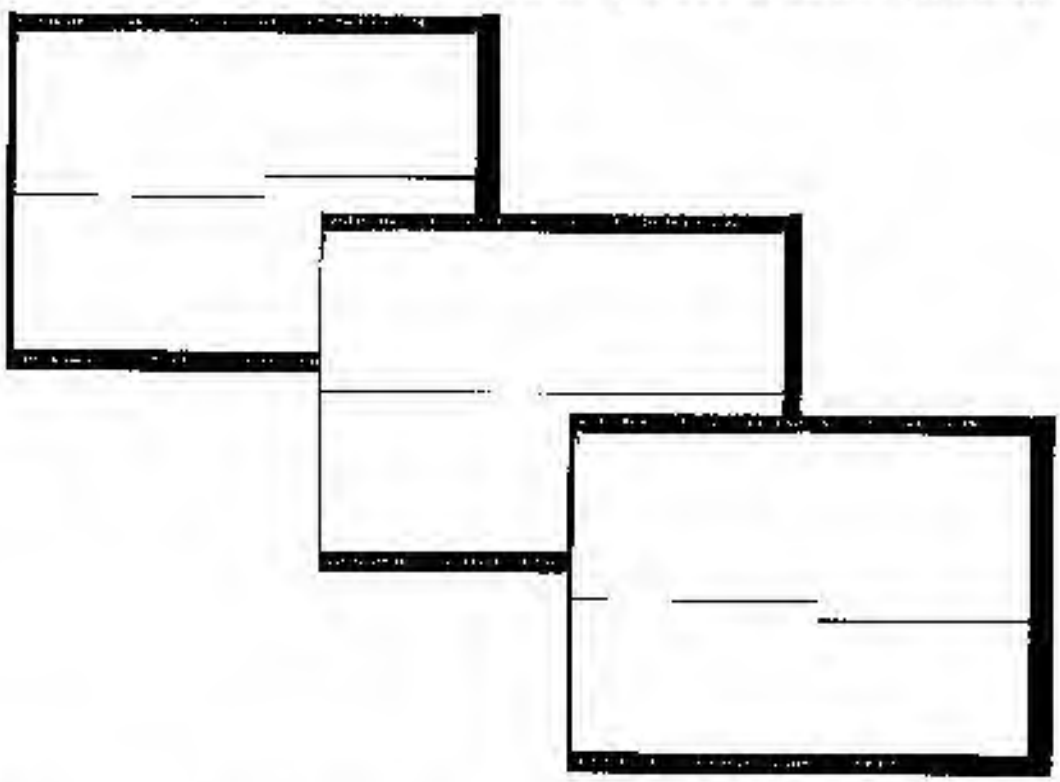

Fig.6.2 CCD Camera Height Adjustment

FSS8200^{DSP}:

1. For the left CCD Camera (seen from front of scanner) adjustment, follow the procedure given above for the FSS5200^{DSP}, but select a "detail window" centered about one-third in from the left in the "overview window".

   Clockwise: Line at Left side of Screen moves Down.
   Counterclockwise:Line at Left side of Screen moves Up.

2. For the right CCD Camera adjustment follow the procedure given above for the FSS5200^{DSP}, but select a "detail window" centered about two-third in from the left in the "overview window".

   Clockwise: Line at Right side of Screen moves Down.
   Counterclockwise:Line at Right side of Screen moves Up.

Note: Only judge the camera height adjustment on the repeated down-scans on the screen to omit angle errors.

FSS10200^{DSP}:

1. For the left CCD Camera (seen from front of scanner) adjustment, follow the procedure given above for the FSS5200^{DSP}, but select a "detail window" centered about one-quarter in from the left in the "overview window".

   Clockwise: Line at Left side of Screen moves Down.
   Counterclockwise:Line at Left side of Screen moves Up.

2. For the third CCD Camera adjustment (second adjustment knob) follow the procedure given above for the FSS5200^{DSP}, but select a "detail window" centered about halfway in from the left in the "overview window".

   Clockwise: Line at Right side of Screen moves Down.
   Counterclockwise:Line at Right side of Screen moves Up.

3. For the right CCD Camera adjustment follow the procedure given above for the FSS5200^{DSP}, but select a "detail win-

dow" centered about three-quarter in from the left in the "overview window".

Clockwise: Line at Right side of Screen moves Down.
Counterclockwise:Line at Right side of Screen moves Up.

Note: Only judge the camera height adjustment on the repeated down-scans on the screen to omit angle errors.

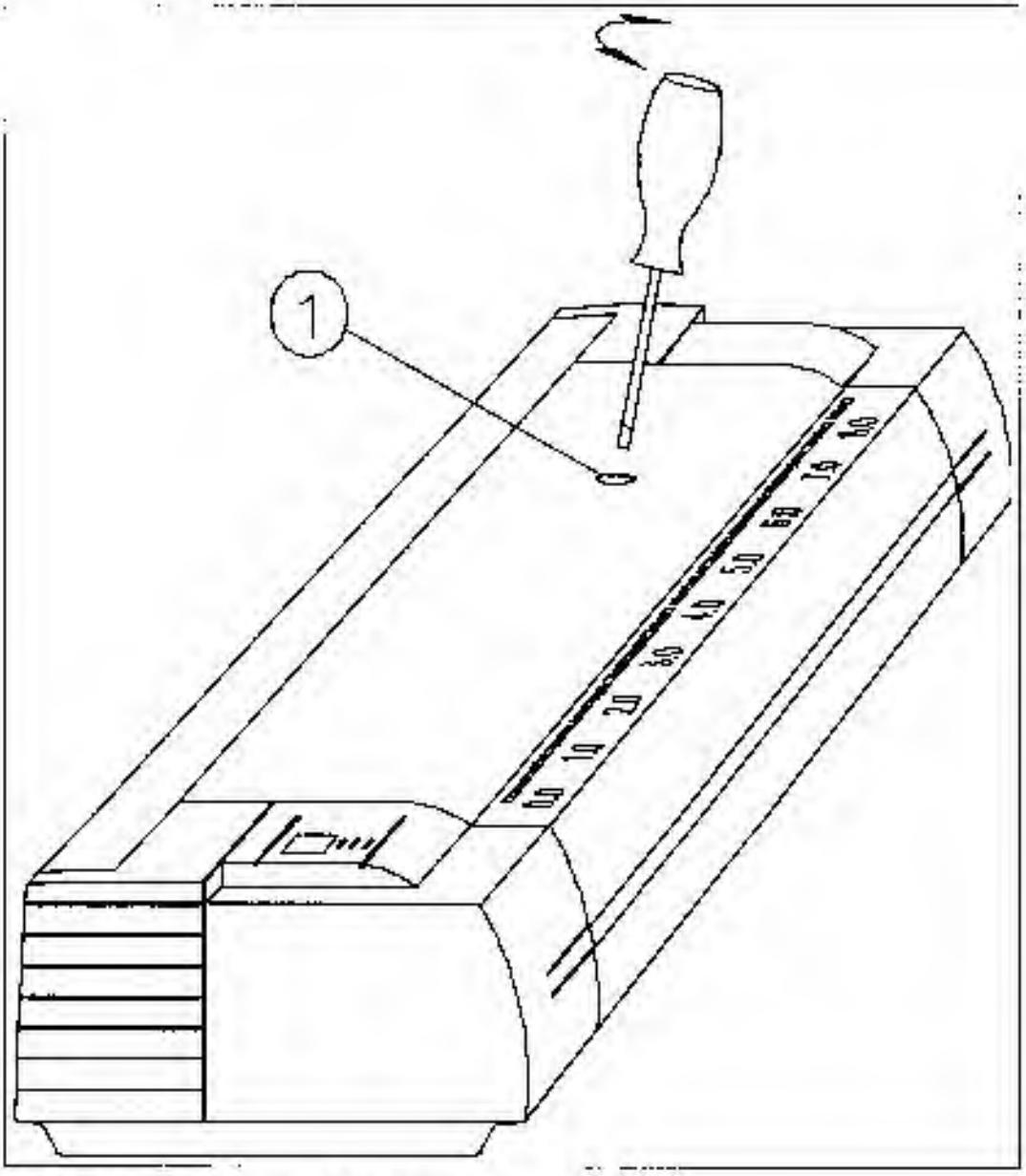

Fig.6.3 Camera Height adjustment

6.3 Camera out of Light error

If both "Diagnostic" and "Warm Up (Wait)" indicators start blinking on the Operator Panel during CCD Camera adjustment, this is because one of the CCD cameras has moved out of range during adjustment or transport, and gets too little light
The " Warm Up" indicator shows by the number of flashes per period which camera is out of light counted from the left side of the machine:

Camera 1: 1 flash per period.
Camera 2: 2 flashes per period.
Camera 3: 3 flashes per period.
Camera 4: 4 flashes per period.

Before proceeding with the CCD camera height adjusment, do the following for the camera out of light:

1. Turn the height adjustment completely counterclockwise.
2. Turn the height adjustment one quarter of a turn clockwise.
3. Turn the FSS power off, and then on. If the error still shows, repeat step 2 and 3.

FSS3200^{DSP}: Camera not user adjustable.
FSS5200^{DSP}: First Camera(1), not user adjustable.
FSS8200^{DSP}: Middle Camera(2), not user adjustable.
FSS10200^{DSP}: Second Camera(2) from the left, not user adjustable.

After clearing the "Camera out of light error", proceed with the CCD Camera Height Adjustment described previously.

A. Glossary

CALS

Computer-aided Acquisition and Logistics Support (CALS) standard, a US-Defense Department and industry initiative that addresses the design, manufacture and support issues of generation, access, management and use of technical data in digital form.

CCITT GROUP 3.

Standard runlength compression format used with FAX transmission. It utilizes modified Huffman coding to further compress the runlength numbers. Most scanner file formats are dialects of this format.

CCITT GROUP4

Two-dimensional compression format, giving very compact image files. Standardized by CALS (Mil 28002) and ISO-ODA for Drawing Archival and Interchange.

COMPRESSED

Reduces file and image sizes of raster Images by encoding the data (See also Run Length Encoding and CCITT Group 3).

DISPLAY

Also called GRAPHIC DISPLAY or MONITOR. Refers to the computer screen attached to your computer, or to the portion of a drawing image, menu etc. shown on the Computer Screen.

HISTOGRAM

A bar graph representing thr statistical distribution of graytones in an image. Each column represents the number of pixels at that graylevel.

PIXEL

Also called DOT. A single element of picture information, representing a small area in the raste image. The value of a pixel depends on the luminance of the area, and is either a single bit for a binary (black and white) image, or multi-bit for a grayscale image.

PROM

Programmable Read Only Memory

RAM

Random Access Memory

RASTER FILE

Also called RASTER IMAGE or BITMAPPED IMAGE. A picture composed of individual dots (picture elements, pixels) the way a scanner sees it. The rows in a high-resolution raster file typically contain 200 or 300 dots per horizontal inch of the original drawing, and there are typically 200 or 300 rows per vertical inch. As each of these dots is defined by location and whether it is *on* or *off*, raster images have large data files.

RESOLUTION

Defines the level of detail that can be captured or shown by a scanner, display or output device. On scanners the resolution is defined by the number of dots (pixels) per inch (dpi) that can be captured horizontally and vertically, e.g. 300 dpi equals 90,000 pixels per square inch.

RUNLENGTH ENCODING

A method of compressing raster or bitmap data by representing "runs" of white or black dots along a scanned line, as the number of dots in each run. Many variations exist of this scheme, with varying compression efficiency. Typically runlength compression formats yield a file 20-25 % the size of an uncompressed file.

SCANNING

The process of running a hardcopy drawing or document through an optical scanner. The scanner produces a digital image (raster image) of the hardcopy drawing, which is stored in RAM or on a disk.

VECTOR FILE

Also called VECTOR DRAWING. Consists of mathernatically defined elements such as: *Line from A to B, Circle with center and radius etc.* CAD systems use vector drawings because of their accuracy and relatively low memory and data file sizes compared to raster images.

VECTORIZATION

Also called RASTER TO VECTOR CONVERSION (RTV). The process of autommatically converting a raster (bitmapped) image into a vector (CAD) drawing.

B. FSS Specifications

Model	FSS3200^{DSP}	FSS5200^{DSP}
Sensors:	**Single CCD**	**Dual CCDs**
	5.400pix.	10.800pix.
Image Resolution (dpi):		
		500,400,
	300,200,	300,200
	150, 75	150, 75,
	50 & 25	50 & 25
Image Size:		
Media Width:	6.0 to 40.0" (1016mm.)	6.0 to 40.0" (1016mm.)
Scan Width: (max.)	36 Inches (914 mm)	36 Inches (914 mm)
Scanner Measurements(Inches/mm.):		
Width:	47.25"/1200	47.25"/1200
Depth:	15.0"/380	15.0"/380
Height:	7.9"/200	7.9"/200
Power:		
Consumpt.:	130W	130W
Voltage:	100/115/220/240V-50/60Hz	
Weight:	41 kg.	42 kg.
Light Source:	Stabilized Fluorescent Lamp	
Interface:	Industry standard SCSI I/F Transfer rate: up to 1.0 Mbit./sec.	
Graylevels:	Up to 256 levels recognized (1Byte, 8Bit per pixel).	
Window Scan:	Adjustable horizontal and Vertical Offset and scan-window size.	
Image Processing:	Digital Signal Processor,2D-Adaptive Threshold. On-line threshold, de-skewing and despeckling. Dynamic and Enhanced Pixel Processing Individual pixel adaptive ampl. correction and graytone interpolation. Image rotation, alignment, mirroring and reverse. On-screen view, zoom, and print functions, more than fourty Industry standard image file formats supported.	

To ensure state of the art products and design, Contex reserves the right to change specifications at any time.

Model	FSS8200^{DSP}	FSS10200^{DSP}
Sensors:	**Triple CCDs**	**Quadruple CCDs**
	16.200pix.	21.600pix.
Image Resolution (dpi):		
	800,600,500 400,300,200, 150, 75 50 & 25	1000,800,600, 500,400,300, 200,150, 75, 50 & 25
Image Size:		
Media Width:	6.0 to 40.0" (1016mm.)	6.0 to 40.0" (1016mm.)
Scan Width: (max.)	36 Inches (914 mm)	36 Inches (914 mm)
Scanner Measurements(inches/mm.):		
Width:	47.25"/1200	47.25"/1200
Depth:	15.0"/380	15.0"/380
Height:	7.9"/200	7.9"/200
Power:		
Consumpt.:	130W	130W
Voltage:	100/115/220/240V-50/60Hz	
Weight:	43 kg.	44 kg.
Light Source:	Stabilized Fluorescent Lamp	
Interface:	Industry standard SCSI I/F Transfer rate: up to 1.0 Mbit./sec.	
Graylevels:	Up to 256 levels recognized (1Byte, 8Bit per pixel).	
Window Scan:	Adjustable horizontal and Vertical Offset and scan-window size.	
Image Processing:	Digital Signal Processor,2D-Adaptive Threshold. On-line threshold, de-skewing and despeckling. Dynamic and Enhanced Pixel Processing Individual pixel adaptive ampl. correction and graytone interpolation. Image rotation, alignment, mirroring and reverse. On-screen view, zoom, and print functions, more than fourty Industry standard image file formats supported.	

To ensure state of the art products and design, Contex reserves the right to change specifications at any time.

C. Regulations

C.1 FCC Regulations

This equipment has been tested and found to comply with the limits for a class B digital device. Pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can generate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock No. 004-000-00345-4.

C.2 German Regulations

FUNKENTSTÖRUNG DEUTSCHLAND

HERSTELLERBESCHEINIGUNG

HIERMIT WIRD BESCHEINIGT, DASS DIE

FULL SCALE SCANNER MODELLEN

FSS3200^{DSP}, FSS5200^{DSP}, FSS8200^{DSP} UND FSS10200^{DSP}

IN ÜBEREINSTIMMUNG MIT DEN BESTIMMUNGEN DER VFG243/1991 FUNKENTSTÖRT SIND.

DER DEUTSCHEN BUNDESPOST WÜRDE DAS INVERKEHRBRINGEN DIESES GERÄTES ANGEZEIGT UND DIE BERICHTIGUNG ZUR ÜBERPRÜFING DER SERIE AUF EINHALTEN DER BESTIMMIGUNGEN EINGERAÜMT.

D. Program License Agreement

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However, Contex warrants the diskette on which the program is furnished to be free from defects in materials and workmanship under normal use for a period of one (1) year from the date of delivery to you, as evidenced by a copy of your receipt.

LIMITATIONS OF REMEDIES

Contex's entire liability and your exclusive remedy shall be:

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The replacement of any diskette not meeting the Contex "Limited Warranty" and which is returned to Contex or an authorized Contex dealer with a copy of your receipt, or

2.

If Contex or the dealer is unable to deliver a replacement diskette which is free of defects in materials or workmanship, you may terminate this Agreement by returning the program and your money will be refunded.

In no event will Contex be liable to you for any damages including any lost profits, lost savings, or other incidental or consequential damages arising out of the use or inability to use such program, even if Contex or an authorized Contex dealer has been advised of the possibility of such damages, or for any claim by any other party. Some states do not allow the limitation or exclusion of liability for incidental or consequential damages, so the above limitation or exclusion may not apply to you.

GENERAL

You may not sublicense, assign or transfer the license of the program except as expressly provided in this Agreement. Any attempt otherwise to sublicense, assign or transfer any of the rights, duties or obligations hereunder is void.

This Agreement will be governed by the laws of Denmark. Should you have any questions concerning this Agreement, you may contact Contex.

You acknowledge that you have read this Agreement, understand it, and agree to be bound by its terms and conditions. You further agree that it is the complete and exclusive statement of the agreement, oral or written and any other communications between us relating to the subject matter of this Agreement.

CONTEX

E. Important safety instructions

Read all of these instructions and save instructions for later use. Follow all warnings and instructions marked on the scanner.

A.Do not place the scanner on an unstable cart, stand, or table. The unit may fall, causing serious damage.

B.Power off this unit before cleaning. Do not use liquid cleaners or aerosol cleaners.
Use a damp cloth for cleaning.

C.The scanner should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.

D.The scanner is equipped with a three-wire grounding type plug. This plug will fit only into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet. contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.

E.Do not allow anything to rest on the power cord. Do not locate the scanner where persons will walk on the cord.

F.If an extension cord is used with the scanner, make sure that the total of the ampere ratings on the products plugged into the extension card does not exceed the extension card ampere rating. Also, make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.

G.Slots or openings in the cabinet and the back or bottom are provided for ventilation; to ensure reliable operation of the product and the protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the unit on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.

H.Never push objects of any kind into the scanner through cabinet slots since they may touch dangerous voltage points or short out parts that could result in a risk of fire or electrical shock. Never spill liquid of any kind on the scanner.

I.Do not attempt to service the scanner yourself. Opening or removing those covers requiring tools may expose you to dangerous voltage points or other risks. Refer all servicing in those compartments to authorized service personnel.

J.Unplug the scanner from the wall outlet and refer servicing to authorized service personnel under the following conditions:

- When the power cord or plug is damaged or frayed.
- If liquid has been spilled into the scanner.
- If the scanner has been exposed to rain or water.
- If the scanner does not operate normally when operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore this product to normal operation.
- If the scanner has been dropped or the cabinet has been damaged.
-
- If the scanner exhibits a distinct change in performance, indicating a need for service.